Smart Configurator for RH850 V1.6.0

Release Note

Introduction

Thank you for using the Smart Configurator for RH850.
This document describes the restrictions and points for caution. Read this document before using the product.

Contents

1. Introduction

Smart Configurator is a utility for combining software to meet your needs. It supports the following three functions related to the embedding of Renesas drivers in your systems: importing middleware, generating driver code, and setting pins.

1.1 System requirements

The operating environment is as follows.

1.1.1 PC

- IBM PC/AT compatibles (Windows® 11 64-bit version, Windows® 10 64-bit versions, Windows® 8.1 64-bit versions)
- Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)
- Memory capacity: 4 GB or more recommended.
- Hard disk capacity: 500 MB or more spare capacity
- Display: 1024 x 768 or higher resolution, 65,536 or more colors

1.1.2 Development Environments

- Renesas electronics Compiler for RH850 [CC-RH] V2.03.00 or later
- GHS Multi V7.1.6 or later
- IAR Embedded Workbench for RH850 V2.21.1 or later

2. Support List

2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RH850 V1.6.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name (Device file version)
RH850/F1KM-S1 Group (R01UH0684EJ0100)	48pin	R7F701693, R7F701694, R7F701695
	64pin	R7F701690, R7F701691, R7F701692
	80pin	R7F701687, R7F701688, R7F701689
	100pin	R7F701684, R7F701685, R7F701686
RH850/F1KM-S4 Group (R01UH0684EJ0100)	100pin	R7F701644, R7F701645
	144pin	R7F701646, R7F701647
	176pin	R7F701648, R7F701649
	232pin	R7F701650, R7F701651
RH850/U2A16 Group (R01UH0864EJ0061)	292pin	R7F702300(V1.10)
	516pin	R7F702300(V1.10)
RH850/U2A8 Group (R01UH0864EJ0061)	292pin	R7F702301(V1.00)
RH850/F1KH-D8 Group (R01UH0684EJ0111)	176pin	R7F701708, R7F701709 (V1.20)
	233pin	R7F701710, R7F701711 (V1.20)
	324pin	R7F701714, R7F701715 (V1.20)
RH850/C1M-A2 Group (R01UH0607EJ0120)	252pin	R7F701275(V1.10)

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RH850 V1.6.0.

Table 2-2 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	Remarks
1	A/D Converter	-	✓	✓	-	✓	
2	CSI Master	Master Transmit	✓	-	✓	✓	
		Master Receive	✓	-	✓	✓	
		Master Transmit/Receive	✓	-	✓	✓	
3	CSI Slave	Slave Transmit	✓	-	✓	✓	
		Slave Receive	✓	-	✓	✓	
		Slave Transmit/Receive	✓	-	✓	✓	
4	Data CRC	-	✓	✓	-	✓	
5	DMA Controller	-	✓	✓	-	✓	
6	DTS Controller	-	-	✓	-	✓	
7	Error Control Module	-	-	✓	-	✓	
8	ATOM Signal Output Mode Compare	-	-	✓	-	-	
9	ATOM Signal Output Mode Immediate	-	-	✓	-	-	
10	ATOM Signal Output Mode PWM	-	-	✓	-	-	
11	ATOM Signal Output Mode Serial	-	-	✓	-	-	
12	Dead Time Module	-	-	✓	-	-	
13	GTM Clock	-	-	✓	-	-	
14	TIM Bit Compression Mode	-	-	✓	-	-	
15	TIM Gated Periodic Sampling Mode	-	-	✓	-	-	
16	TIM Input Event Mode	-	-	✓	-	-	
17	TIM Input Prescaler Mode	-	-	✓	-	-	
18	TIM Pulse Integration Mode	-	-	✓	-	-	
19	TIM PWM Measurement Mode	-	-	✓	-	-	

Table 2-3 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	Remarks
20	TIM Serial Shift Mode	-	-	✓	-	-	
21	Time Base Unit	-	-	✓	-	-	
22	Interrupt Controller	-	✓	✓	-	✓	Only table reference method
23	Key Return	-	✓	-	-	-	
24	MSPI Master	Transmit	-	✓	-	-	No support LVDS mode
		Receive	-	✓	-	-	
		Transmit/Receive	-	✓	-	-	
25	MSPI Slave	Transmit	-	✓	-	-	
		Receive	-	✓	-	-	
		Transmit/Receive	-	✓	-	-	
26	OS Timer	-	✓	✓	-	✓	
27	Ports	-	✓	✓	✓	✓	
28	Real-Time Clock	-	✓	✓	-	-	
29	RIIC	Master	✓	✓	✓	✓	
		Slave	✓	✓	✓	✓	
30	SCI3 Asynchronous Mode	Transmission	-	✓	-	✓	
		Reception	-	✓	-	✓	
		Transmission / Reception	-	✓	-	✓	
		Multi-processor Transmission	-	✓	-	✓	
		Multi-processor Reception	-	✓	-	✓	
		Multi-processor Transmission / Reception	-	✓	-	✓	
31	SCI3 Clock Synchronous Mode	Transmission	-	✓	-	✓	
		Reception	-	✓	-	✓	
		Transmission / Reception	-	✓	-	✓	
32	Stand-by Controller	-	✓	✓	-	-	Only Stop and DeepStop mode
33	Clock Divider	-	✓	✓	✓	✓	
34	Delay Count	-	✓	✓	✓	✓	

Table 2-4 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850F1 KH	RH850 C1M	Remarks
35	External Event Count	-	✓	✓	✓	✓	
36	Input Interval Timer	-	✓	✓	✓	✓	
37	Input Period Count Detection	-	✓	✓	✓	✓	
38	Input Position Detection	-	✓	✓	✓	✓	
39	Input Pulse Interval Judgment	-	✓	✓	✓	✓	
40	Input Pulse Interval Measurement	-	✓	✓	✓	✓	
41	Input Signal Width Judgement	-	✓	✓	✓	✓	
42	Input Signal Width Measurement	-	✓	✓	✓	✓	
43	Interval Timer	-	✓	✓	✓	✓	
44	One-Pulse Output	-	✓	✓	✓	✓	
45	One-Shot Pulse output	-	✓	✓	✓	✓	
46	Overflow Interrupt Output (Input Period Count Detection)	-	✓	✓	✓	-	
47	Overflow Interrupt Output (Width Measurement)	-	✓	✓	✓	-	
	PWM Output	-	✓	✓	✓	✓	
49	Triangle PWM Output	-	✓	✓	✓	✓	
50	Triangle PWM Output with Dead Time	-	-	✓	✓	✓	
51	UART Interface	Transmission	✓	✓	✓	✓	
		Reception	✓	✓	✓	✓	
		Transmission / Reception	✓	✓	✓	✓	
52	Window Watchdog Timer	-	✓	✓	-	✓	

2.3 New support

2.3.1 Smart Configurator icon is added into About dialog

From Smart Configurator for RH850 V1.6.0, Smart Configurator icon is added into the About dialog. User can learn more about Smart Configurator by clicking the icon, such as license information.

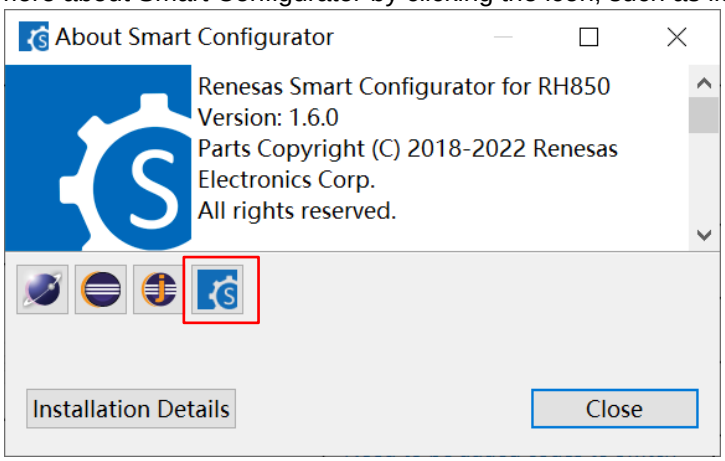

Figure 2-1. Smart configurator icon is added into About dialog

3. Changes

This chapter describes changes to the Smart Configurator for RH850 V1.6.0.

3.1 Correction of issues/limitations

Table 3-1 List of Correction of issues/limitations

✓: Applicable, -: Not Applicable

No	Description	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	Remarks
1	Fixed T&H path self-diagnosis function of A/D Converter enabled/disabled failed issue	-	✓	-	-	
2	Fixed redundant macros and wrong comments issue in A/D Converter header file	-	✓	-	-	

3.1.1 Fixed T&H path self-diagnosis function of A/D Converter enabled/disabled failed issue

When using T&H path self-diagnosis function of A/D Converter, the function can't be enabled/disabled correctly even if the T&H path self-diagnosis function is already selected/unselected on GUI. The actual generated code is the opposite of the GUI setting.
Please refer to the document number R20TS0806 of RENESAS TOOL NEWS.
This issue has been fixed from Smart Configurator for RH850 V1.6.0.

3.1.2 Fixed redundant macros and wrong comments issue in A/D Converter header file

When using A/D Converter, there are mistakes in header file(r_cg_ad.h).
Please refer to the document number R20TS0806 of RENESAS TOOL NEWS.
This issue has been fixed from Smart Configurator for RH850 V1.6.0.

3.2 Specification changes

Table 3-2 List of Specification changes

✓: Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1KH	RH850C1M	Remarks
1	Improved Physical channel selection function of A/D Converter	✓	-	-	-	
2	Improved message of local RAM access for DMA Controller	✓	✓	-	-	
3	Improved PLL0/PLL1 clock selection	-	-	-	✓	
4	Improved generated code of DMA suspended/resumed function	✓	-	-	-	
5	Improved MSPI Master/MSPI Slave UI	-	✓	-	-	
6	Improved Interrupt tool to display interrupt resource sharing same interrupt channel	✓	✓	✓	✓	
7	Improved Data format setting of A/D converter	-	✓	-		
8	Improved generated code of A/D Converter Synchronization Start function	-	✓	-	-	
9	Improved generated code of A/D converter voltage monitoring voltage divider function	-	✓	-	-	
10	Improved generated code of getting A/D conversion result	✓	✓	-	-	

3.2.1 Improved Physical channel selection function of A/D Converter

From Smart Configurator for RH850 V1.6.0, when using A/D Converter component, regardless of 10-bit mode or 12-bit mode, all Physical Channels (ADCAnIx, ADCAnIxS) can be selected.

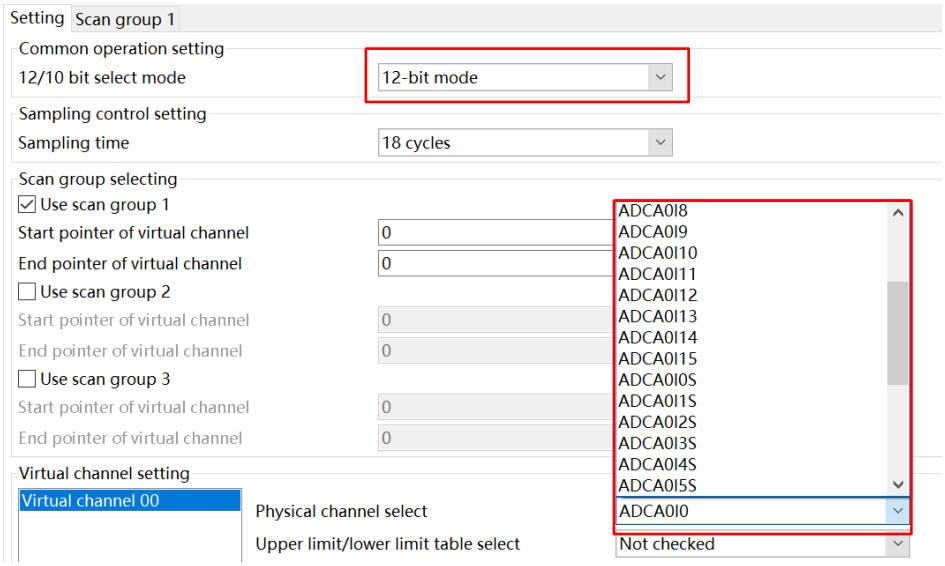

Figure 3-1. All physical channels are supported in 10-bit/12-bit mode

3.2.2 Improved message of local RAM access for DMA Controller

From Smart Configurator for RH850 V1.6.0, when set Source address and Destination address to access local RAM, prompt message displayed on UI to tell user to set PEG register first.

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Figure 3-2. PEG register setting message

3.2.3 Improved PLL0/PLL1 clock selection

From Smart Configurator for RH850 V1.6.0, user can select PLL1 as the source of Divider 0A on Clock UI, but user must add code to switch to PLL0 manually according to prompt message “Need to be added codes to switch to PLL0 by user”.

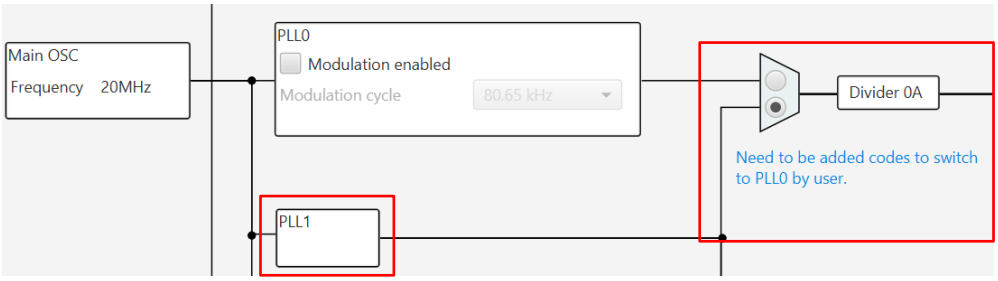

Figure 3-3. PLL1 selected as the source of Divider 0A

3.2.4 Improved generated code of DMA suspended/resumed function

From Smart Configurator for RH850 V1.6.0, APIs to support DMA transfer for all channels suspended/resumed function of DMA Controller are added:

Source file: r_cg_dma_common.c
API added: void R_PDMA0_Suspend (void)
void R_PDMA0_Resume (void)

3.2.5 Improved MSPI Master/MSPI Slave UI

From Smart Configurator for RH850 V1.6.0, MSPI Master and MSPI Slave UI are improved for more easier understanding and use.

1) "Error: xxx%" is added for user to understand current error value (Only for MSPI Master).

Figure 3-4. UI setting for Baudrate

2) DMA/DTS trigger generator setting is improved easier to understand and use.

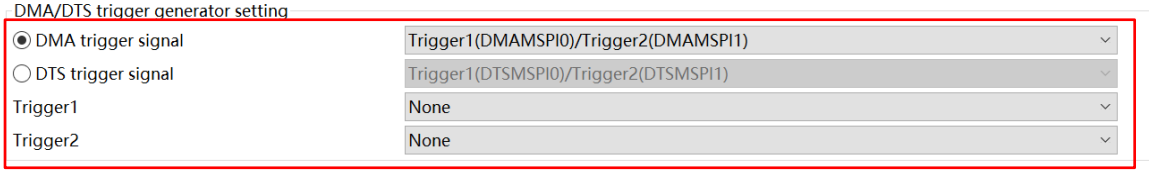

Figure 3-5. DMA/DTS trigger generator setting

3) Display fixed value of "Setup time/Hold time/Idle time/Inter-data time" (only for MSPI Slave).

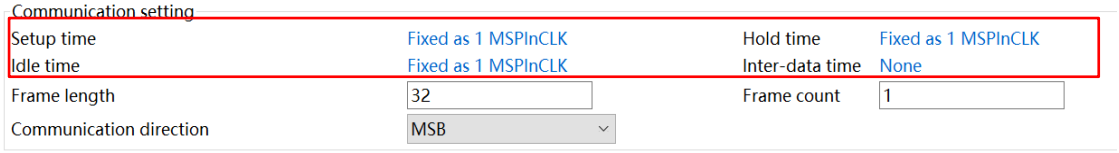

Figure 3-6. Setup time/Hold time/Idle time/Inter-data time setting

3.2.6 Improved Interrupt tool to display interrupt resource sharing same interrupt channel

From Smart Configurator for RH850 V1.6.0, Interrupt tool supports displaying all interrupt resource which share same interrupt channel as following figure shows:

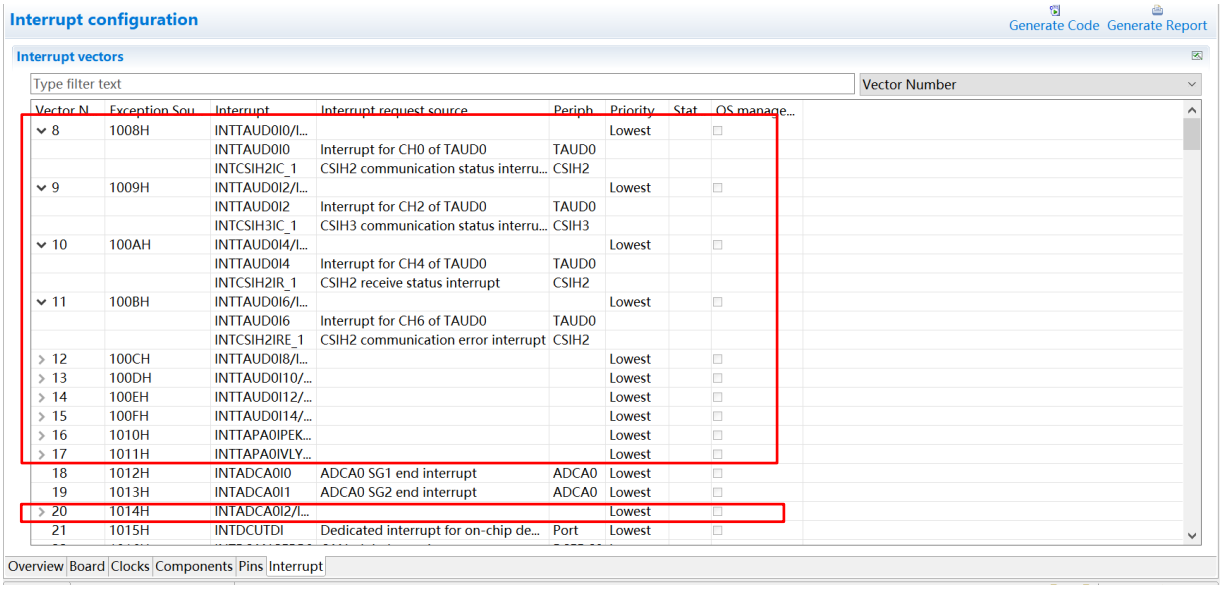

Figure 3-7. Interrupt tool supports all interrupt resource display

3.2.7 Improved Data format setting of A/D converter

From Smart Configurator for RH850 V1.6.0, when using A/D Converter component, invalid 10-bit data format is removed, and only 12-bit data format is supported for Data format.

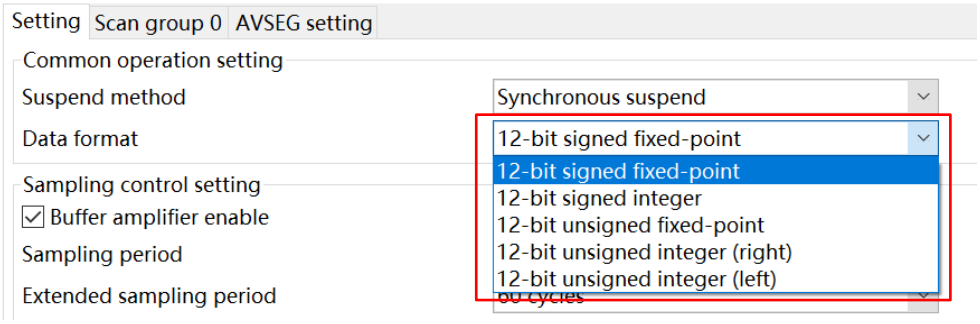

Figure 3-8. Only 12-bit data format supported

3.2.8 Improved generated code of A/D Converter Synchronization Start function

From Smart Configurator for RH850 V1.6.0, APIs for Synchronization Start function of A/D Converter are improved:

Source file: <*Configuration-name*>.c
API removed: void R_<*Configuration-name*>_SyncStart (void)
void R_<*Configuration-name*>_SyncTimerStart (void)

Source file: r_cg_adc_common.c
API added: void R_ADC_SyncStart (void)
void R_ADC_TimerSyncStart (void)

3.2.9 Improved generated code of A/D converter voltage monitoring voltage divider function

From Smart Configurator for RH850 V1.6.0, "Voltage divider control" setting is removed from A/D Converter UI and following APIs are added. So that user can enable/disable voltage divider function after A/D converter has been started.

Source file: <*Configuration-name*>.c
API added: void R_<*Configuration-name*>_VoltageDivider_Start (void)
void R_<*Configuration-name*>_VoltageDivider_Stop (void)

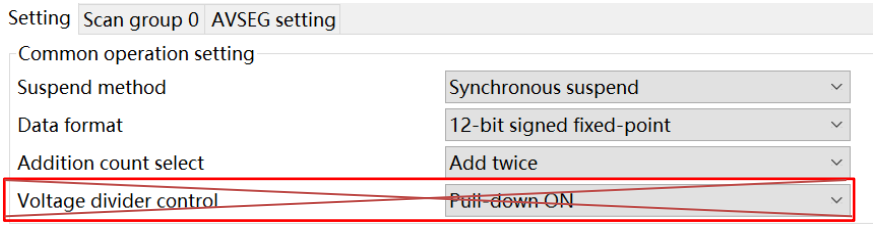

Figure 3-9. Remove Voltage divider control from UI

3.2.10 Improved generated code of getting A/D conversion result

From Smart Configurator for RH850 V1.6.0, APIs of getting A/D conversion result are improved:

1) Add new parameter "*buffer_size*" to ensure the allocated buffer is enough for saving the converted data:

   Source file: <*Configuration-name*>.c
   API updated: void R_<*Configuration-name*>_ ScanGroup*x*_GetResult (uint16_t * const buffer, *uint8_t buffer_size*)

2) Remove the getting floating point result API because RH850U2A does not support IFC function:

   Source file: <*Configuration-name*>.c
   API removed: void R_<*Configuration-name*>_ ScanGroup*x*_GetFloatingPointDataResult (uint32_t * const buffer)

4. List of RENESAS TOOL NEWS AND TECHNICAL UPDATE

Below is a list of notifications delivered by RENESAS TOOL NEWS and TECHNICAL UPDATE.

Issue date	Document No.	Description	Applicable MCUs	Fixed version
Mar.16, 2019	R20TS0407	1. Build error occurs when setting not to generate clocks 2. RAM size display error https://www.renesas.com/document/tnn/notes-rh850-smart-configurator	RH850F1KM	V1.2.0
Jun. 01, 2016	R20TS0431	When using PLL0 Clock https://www.renesas.com/document/tnn/notes-rh850-smart-configurator-0	RH850F1KM	V1.2.0
Jul.01, 2019	R20TS0441	1. When using PWM output and triangle PWM output slave setting 2. Port input buffer setting error 3. Port drive strength control setting error 4. Port register setting error https://www.renesas.com/document/tnn/notes-smart-configurator-rh850	RH850F1KM	V1.2.0
Aug.01, 2019	R20TS0463	1. When using the input pulse interval measurement function 2. When using the Clocked Serial Interface in Master mode https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-0	RH850F1KM	V1.2.0
Oct.16, 2019	R20TS0500	1. When using data CRC 2. When using one-pulse outputs https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-1	RH850F1KM	V1.2.0
Apr.16, 2020	R20TS0569	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-2	RH850F1KM	V1.3.0
May.16, 2020	R20TS0576	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-3	RH850F1KM	V1.3.0
Feb. 16, 2021	R20TS0668	When using CSI master https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-4	RH850F1KM	V1.4.0

Issue date	Document No.	Description	Applicable MCUs	Fixed version
Apr. 05, 2021	R20TS0679	1. When using CSI Master and CSI Slave with CSIG 2. When using CSI Master with CSIH 3. When using Data CRC 4. When using One-Pulse Output and One-Shot Pulse Output 5. When using PWM Output and Triangle PWM Output https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-5	RH850F1KM RH850U2A	V1.4.0
Jun.16, 2021	R20TS0717	1. When using A/D converter with ADCJ2 https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-6	RH850U2A	V1.5.0
Jul. 01, 2021	R20TS0723	1.Notes on using One-Shot Pulse Output, PWM Output, Triangle PWM Output, Triangle PWM Output with Dead Time functions with TAUD1, TAUD2 https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-7	RH850U2A	V1.5.0
Sep. 16, 2021	R20TS0744	1.Notes on selecting PLL0 clock CPLL0OUT as source of CPU Subsystem clock 2.Notes on using CSIH Master receive and Master transmit/receive operation mode https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-8	RH850F1KM RH850F1KH	V1.5.0
Feb. 01, 2022	R20TS0806	1.Notes on using T&H path self-diagnosis function of A/D Converter 2.Notes on redundant macros and wrong comments in A/D Converter header file https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-9	RH850U2A	V1.6.0

5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RH850 V1.6.0.

5.1 List of Limitation

Table 5-1 List of Limitation

✓: Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1KH	RH850C1M	Remarks
1	Note on using RIIC	✓	✓	✓	✓	
2	Note on using Physical channel of A/D Converter	–	✓	–	–	
3	Note on using Common operation setting of A/D Converter	–	✓	–	–	

5.2 Details of Limitation

5.2.1 Note on using RIIC

When using RIIC master or RIIC Slave to send or receive data, error interrupt priority must be higher than any other interrupt priority.

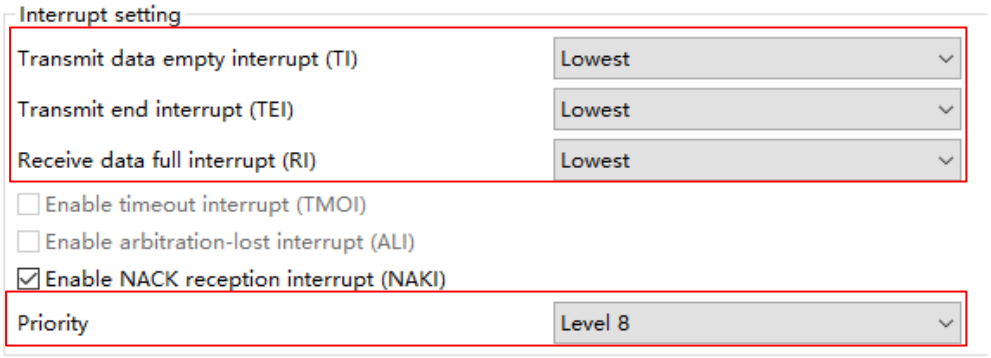

Figure 5-1. RIIC interrupt priority setting

5.2.2 Note on using Physical channel of A/D Converter

When selecting ADCJnI0S~ADCJnI9S as Physical channel in Smart Configurator for RH850 V1.6.0, after reloading the project in Smart Configurator for RH850 V1.6.0, Physical channel will be changed to “ADCJnI0” which is default setting.
This limitation will be fixed in Smart Configurator for RH850V1.7.0.

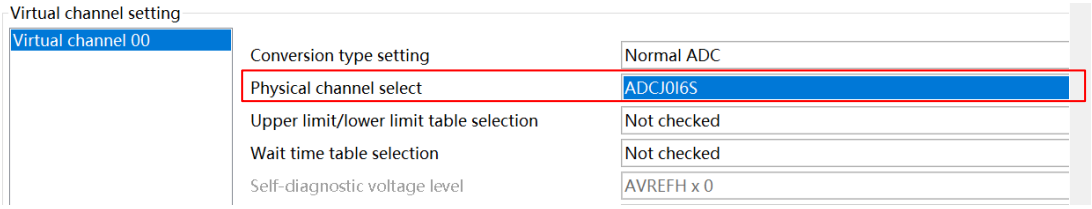

Figure 5-2. Physical channel setting before reloading

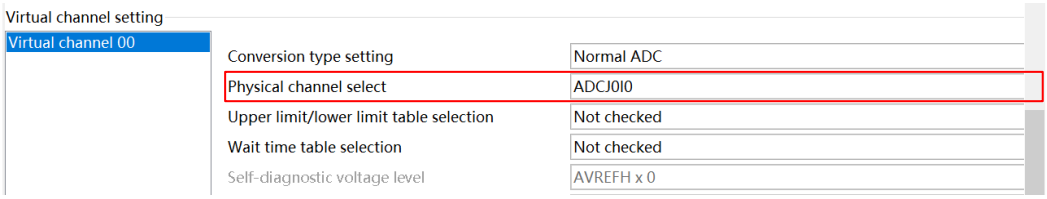

Figure 5-3. Physical channel setting after reloading

5.2.3 Note on using Common operation setting of A/D Converter

“Addition count select” in “Common operation setting” of A/D Converter is not supported in Smart Configurator for RH850 V1.6.0, it should be supported.
This limitation will be fixed in Smart Configurator for RH850V1.7.0.

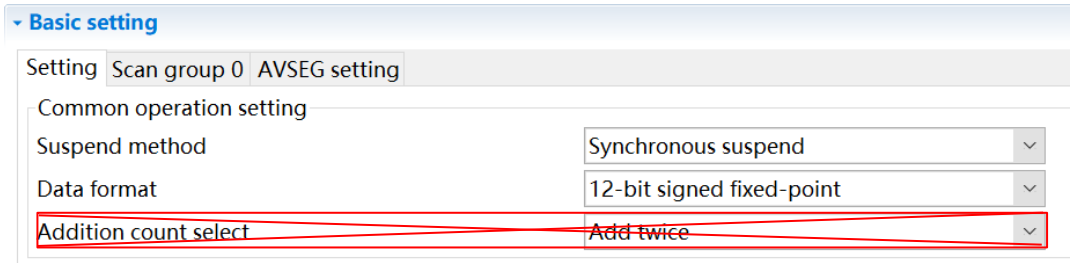

Figure 5-4. Addition count select is not supported in Smart Configurator for RH850 V1.6.0

6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RH850 V1.6.0.

6.1 List of Caution

Table 6-1 List of Caution

✓: Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1KH	RH850C1M	Remarks
1	About the I/O define header file	✓	✓	✓	✓	
2	About loading the project on CS+	✓	✓	✓	✓	
3	About the sample projects	✓	✓	✓	✓	
4	About the decimal point	✓	✓	✓	✓	
5	Note on pins sharing functions.	✓	✓	✓	✓	
6	Note on Interrupt Controller resource name	✓	-	-	-	
7	Note on DMA/DTS trigger generator setting of MSPI Master	-	✓	-	-	
8	Note on CPU Operating mode of DTS Controller	-	✓	-	-	

6.2 Details of Caution

6.2.1 About the I/O define header file

Please use Renesas iodefine.h for the header file that defines the register. Because RH850 Smart Configurator outputs code conforming to the definition in Renesas iodefine.h, a build error occurs when using the register definition file provided by other environments

6.2.2 About loading the project on CS+

When launching RH850 Smart Configurator from CS+, please set 'RH850 Build tool CC-RH plugin' and 'RH850 Build tool GHS CCRH850 plugin' to enable. If these plugins are disable, the error occurs when CS+ project that includes the setting of RH850 Smart Configurator is loaded.

6.2.3 About the sample project

The RH850 Smart Configurator does not output the processing after resetting the microcontroller (including the startup routine).
Therefore, we provide sample projects that include sample startup routines and other necessary processing so that user applications can be built immediately after peripheral modules are set up using the RH850 Smart Configurator.
Please refer to the user guide for sample projects under installation path.
Default installation path:
C:\Program Files (x86)\Renesas Electronics\SmartConfigurator\RH850\

6.2.4 About the decimal point

For error-free operation of the RH850 Smart Configurator, use a period (".") as the decimal point and a comma (",") as the digit grouping separator. Which of "." (period), "," (comma) or ", " (space) is used as the decimal point or digit grouping separator differs depending on the language setting of the Windows OS that is used. For example, if you use a comma (",") as the decimal point, the RH850 Smart Configurator may not work correctly. This will occur when you are using Windows OS with language set to other than Japanese or English. If you are using the RH850 Smart Configurator on Windows OS with language set to other than Japanese or English, change the language setting to Japanese or English.

6.2.5 Note on pins sharing functions

When function shared pin selects a shared pin, shared pin displays an error.
But the shared pin can be selected correctly and work correctly.
Example) For RH850/U2A RSENT0
Assign RSENT0RX and RSENT0SPCO to the T24 pin
When assigned: T24 pin displays an error

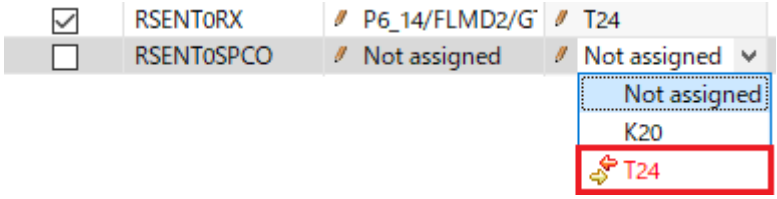

Figure 6-1. pins sharing function sample when assigned

After assignment

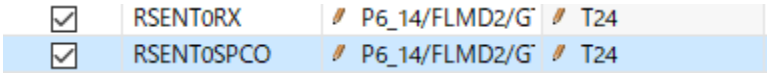

Figure 6-2. pins sharing function sample after assigned

6.2.6 Note on Interrupt Controller resource name

In RH850 Smart Configurator V1.2.0, the resource name of the interrupt controller has been changed to “INTC”. The resource name of the interrupt controller of the previous version is automatically changed from "ICU" to “INTC”.
Therefore, the following file name and macro name are changed.

Table 6-2 File name change

Before change	After change
r_cg_icu.h	r_cg_intc.h

Table 6-3 Macro name change

File name	Before change	After change
r_smc_interrupt.h	ICU_xxx_PRIORITY	INTC_xxx_PRIORITY

6.2.7 Note on DMA/DTS trigger generator setting of MSPI Master

If alternative trigger is selected in Smart Configurator for RH850 V1.5.0, when reloading the project file (.scfg file) into Smart Configurator for RH850 V1.6.0, the alternative trigger signal “Use alternative trigger” can`t be reloaded and the default trigger signal
“Trigger1(DTSMSPI12)/Trigger2(DTSMSPI13)” will be used.
There isn`t this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.

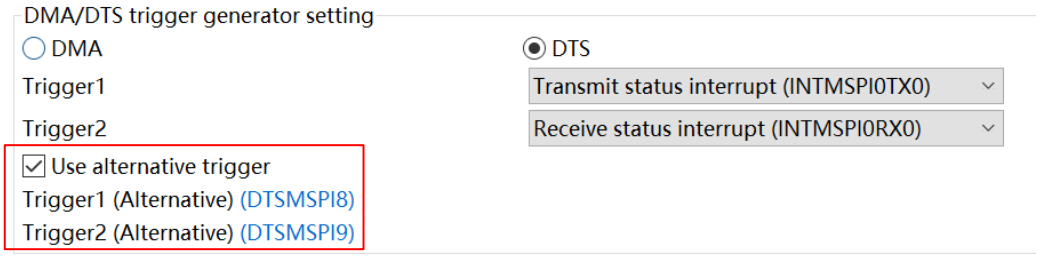

Figure 6-3. “Use alternative trigger” checked in Smart Configurator for RH850 V1.5.0

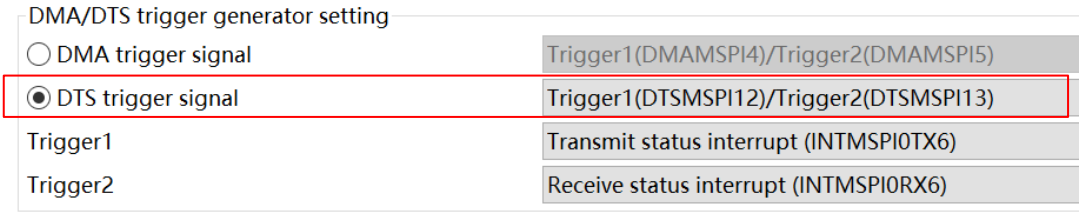

Figure 6-4. “Trigger1(DTSMSPI12/Trigger2(DTSMSPI13)” selected after reloading in Smart Configurator for RH850 V1.6.0

6.2.8 Note on CPU Operating mode of DTS Controller

If CPU operating mode selects “User mode” in Smart Configurator for RH850 V1.5.0, after reloading the project in Smart Configurator for RH850 V1.6.0, CPU operating mode will be changed to “Supervisor mode” which is default setting.
There isn`t this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.

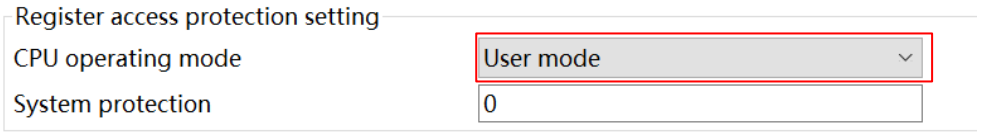

Figure 6-5. CPU operating mode in Smart Configurator for RH850 V1.5.0

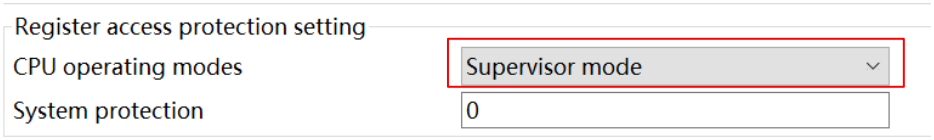

Figure 6-6. CPU operating mode after reloading in Smart Configurator for RH850 V1.6.0

Revision History

Rev.	Date	Description	
		Page	**Summary**
1.00	July.20.19	-	Create new
1.20	Jan.16.20	-	Update to Rev.1.2.0
1.30	Jan.20.21	All	Update to Rev.1.3.0: 1. update format 2. update all changes 3. Page 3, GHS Multi V7.6.1 is changed to GHS Multi V7.1.6
1.40	May.20.21	All	Update to Rev 1.4.0: 1. Support RH850F1KH-D8 2. Add new feature support 3. Update changes including issues and improvements.
1.41	Jun.20.21	4	Update “Table 2-1 Support Devices” and add RH850/F1KH-D8, RH850/U2A16 and RH850/U2A8 device file version.
1.50	Sep.16.21	All	Update to Rev 1.5.0: 1. Support RH850C1M-A2 2. Add new feature support 3. Update changes including issues and improvements. 4. Update limitation 5. Update cautions for 6.2.3
1.60	Jul.20.22	All	Update to Smart Configurator for RH850 V1.6.0: 1. Support new components for RH850C1M-A2 2. Update changes including issues and improvements. 3. Update List of RENESAS TOOL NEWS AND TECHNICAL UPDATE 4. Update cautions

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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